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IS 3312 (1984): steel shelving cabinets (adjustable type)  
-Specification [CED 35: Furniture]

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“Knowledge is such a treasure which cannot be stolen”





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*Indian Standard*  
**SPECIFICATION FOR  
STEEL SHELVING CABINETS  
(ADJUSTABLE TYPE)**  
*(Second Revision)*

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**BUREAU OF INDIAN STANDARDS**  
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*Indian Standard*

SPECIFICATION FOR  
STEEL SHELVING CABINETS  
(ADJUSTABLE TYPE)

*( Second Revision )*

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## *Indian Standard*

### SPECIFICATION FOR STEEL SHELVING CABINETS (ADJUSTABLE TYPE)

*(Second Revision)*

#### 0. FOREWORD

**0.1** This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 30 January 1984, after the draft finalized by the Furniture Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** This standard was first published in 1965 and subsequently revised in 1974. In this revision the grades of materials to be used in components have been specified.

**0.3** This standard contains clause 10 which requires the purchaser to supply certain information at the time of placing orders.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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#### 1. SCOPE

**1.1** This standard covers the requirements for materials, sizes, construction and finish of adjustable steel shelving cabinets with hinged doors with or without the provision of a locker.

#### 2. MATERIAL

**2.1 Aluminium Tube** — Aluminium tubes shall conform to IS Designation 65032 of IS : 1285-1975†.

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\*Rules for rounding off numerical values (*revised*).

†Specification for wrought aluminium and aluminium alloy, extruded round tube and hollow sections (for general engineering purposes) (*second revision*).

**2.2 Electrodes** — The welding electrodes for gas, arc, and spot welding shall conform to IS : 1278-1972\* and IS : 814 ( Part 2 )-1974† and IS : 4972-1968‡ respectively.

**2.3 Mild Steel Sheets** — Mild steel sheets shall conform to grade 0 of IS : 1079-1973§ or grade 0 of IS : 513-1973||.

**2.4 Mild Steel Rounds and Flats** — Mild steel rounds and flats shall conform to grade Fe 310-0 ( St 320 ) of IS : 1977-1975¶.

**2.5 Screws** — Screws shall conform to IS : 1365-1978\*\*.

### 3. DIMENSIONS AND TOLERANCES

**3.1 Dimensions** — The dimensions of both the types of shelving cabinets shall be as given in Table 1 ( see Fig. 1 ).

**NOTE** — Minimum clearance required for the shelving cabinets to be put into recesses or openings, where required, shall be as follows:

- a) For top of cabinet 20 mm,
- b) For each side of cabinet 10 mm, and
- c) For depth of cabinet 5 mm

**3.2 Tolerances** — The overall dimensions specified in 3.1 shall not vary by more than  $\pm 5$  mm.

### 4. FABRICATION

**4.1 Components** — Steel shelving cabinets shall be assembled from the components given in 4.2 to 4.10.

**TABLE I OVERALL DIMENSIONS OF SHELVING CABINETS**

( Clause 3.1 and Fig. 1 )

All dimensions in millimetres.

SL No.	SIZE	DIMENSIONS		
		Height*	Width	Depth
(1)	(2)	(3)	(4)	(5)
i)	Small	1 155	760	430
ii)	Large	1 855	910	480

\*Excluding the height of pedestal.

\*Specification for filler rods and wires for gas welding ( *second revision* ).

†Specification for covered electrodes for metal arc welding of structural steel : Part 2 For welding sheets ( *fourth revision* ).

‡Specification for resistance spot-welding electrodes.

§Specification for hot rolled carbon steel sheet and strip ( *third revision* ).

||Specification for cold rolled carbon steel sheets ( *second revision* ).

¶Specification for structural steel ( ordinary quality ) ( *second revision* ).

\*\*Specification for slotted countersunk head screws ( *third revision* ).

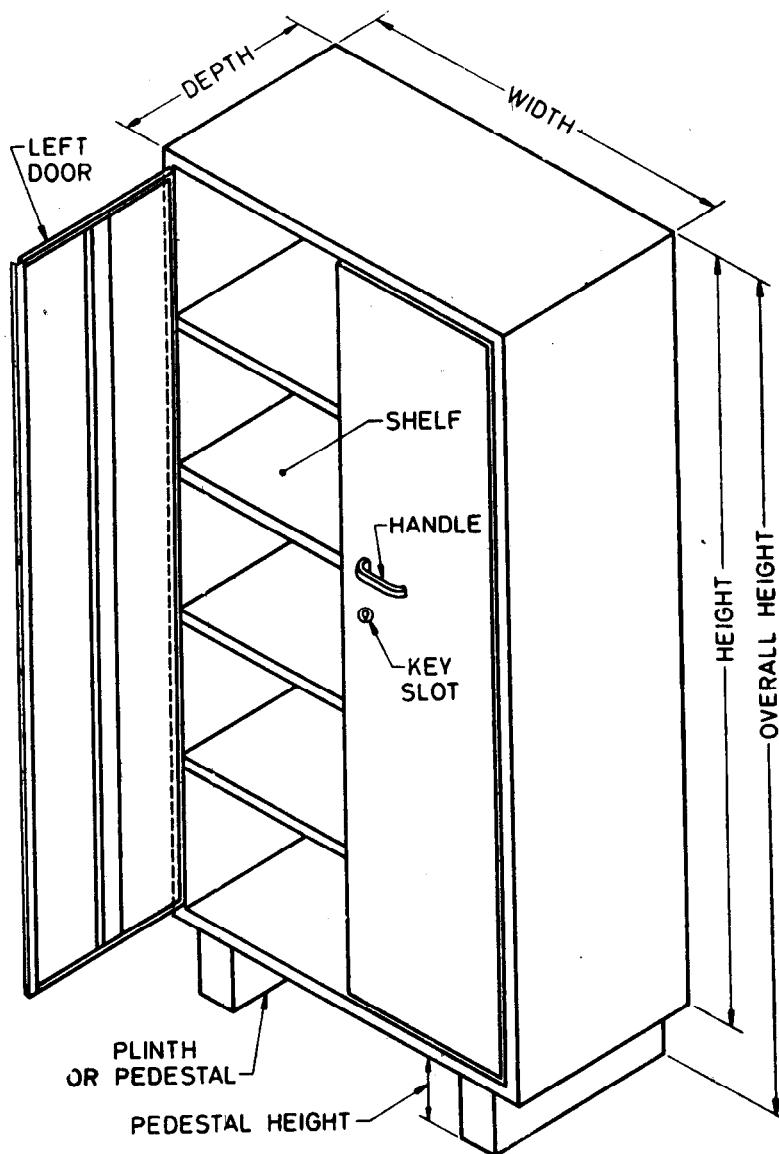


FIG. 1 TYPICAL SKETCH OF STEEL SHELVING CABINET

**4.2 Sides** — The sides shall be made from mild steel sheet not less than 0·8 mm thick and without any burrs or dents. The width of the side sheets shall correspond to the depth of the top. The sides shall extend between the extreme surfaces of the top and bottom shelves.

**4.3 Back** — The back shall be made from mild steel sheet not less than 0·8 mm thick and without any burrs or dents. The width of the back sheet shall correspond to width of the top. The back shall extend between the extreme surface of the top and bottom shelves.

**4.4 Top and Bottom** — The length of the top and bottom shall cover the width of the cabinet and the breadth shall cover the depth of the cabinet. These shall be made from mild steel sheet not less than 0·8 mm thick without any burrs or dents.

**4.5 Shelves** — The shelves shall be made from mild steel sheet not less than 0·8 mm thick. Shelves shall have lipped flanges 25 mm in width and 15 mm in depth. Each shelf shall be supported on four shelf brackets. The bracket shall be made of steel sheeting not less than 1·6 mm thick. The bracket shall be so designed and constructed that the shelf is securely supported and that adjustment inside the bracket can be affected easily. Four rack strips shall be provided for supporting the shelves, covering the full height of the cabinet. Rack strips shall be of mild steel and shall be not less than 1·0 mm in thickness.

**4.5.1 Shelf Supporting Arrangement** — The shelves shall be supported on four adjustable brackets.

**4.6 Doors** — The steel shelving cabinets shall be provided with two door leaves as described in 4.6.1 and 4.6.2.

**4.6.1 Right Door** — This shall be formed out of mild steel sheet not less than 0·8 mm thick having metal stiffeners suitably welded or riveted to stiffen the door. The centre-to-centre distance between two adjacent welding spots or rivets shall not exceed 200 mm. The door shall be hinged to the right side of the cabinet and shall have a hole for the handle and a key slot for the key of the lock. The clearance around the door between the door flanges and side, top and bottom flanges shall not be more than 1·25 mm.

**4.6.2 Left Door** — This shall be similarly constructed as the right door and hinged to the left side of the cabinet. The door shall have a rebate on the free end over which the right door shall overlap. The clearance between the two doors when closed, and around the left door shall not be more than 1·25 mm.

**4.7 Pedestal** — The pedestal shall be made from mild steel sheet not less than 0·8 mm thick and shall be properly stiffened. The pedestal shall not project out of the cabinet and shall be  $125 \pm 5$  mm in height.

**4.8 Hinges** — The hinges shall be either plain butt type made from mild steel sheet not less than 1.6 mm thick or double folded type fabricated from mild steel sheets not less than 1.25 mm thick. The hinges shall be secured to the mild steel hinge brackets not less than 2.5 mm thick on one side and shall be secured to the door on the other side of the fulcrum. The number of hinges per door leaf shall be not less than two for small size and not less than three for large size.

**4.9 Locks** — Steel shelving cabinet shall be supplied with lock. The lock shall not be less than six lever lock with duplicate keys of non-corrodible material and shall conform to IS : 729 - 1979\*. For the locking arrangement, there shall be a three-way bolting device controlled by a lock and operated by brass or zinc base alloy handle.

**4.10 Lockers** — The inside dimensions of lockers for both types of shelving cabinets shall be as given in Table 2.

**TABLE 2 INSIDE DIMENSIONS OF LOCKERS**  
All dimensions in millimetres.

SL. NO.	SIZE	INSIDE DIMENSIONS		
		Height	Width	Depth
(1)	(2)	(3)	(4)	(5)
i)	Small	250	758	380
ii)	Large	300	908	430

**4.10.1 Lockers Components** — The locker shall be assembled from the components specified in 4.10.2 to 4.10.4.

**4.10.2 Doors** — Two doors shall be provided to the locker of large size shelving cabinet and one door to the locker of small size shelving cabinet. The doors shall be made out of mild steel sheets not less than 1.0 mm thick. The door shall have a cover fitted from inside to form a box section. This cover shall be made out of mild steel sheet not less than 0.63 mm thick.

**4.10.3 Locks** — Locker shall have a handle made out of non-corrodible material and shall be fitted with a lock as given in 4.10.3.1.

**4.10.3.1** The locker shall be fitted with a lock having not less than six levers with duplicate keys made of non-corrodible material. For locking there shall be a two-way bolting system controlled by the lock.

\*Specification for drawer locks, cupboard locks and box locks (*third revision*).

**4.10.4 Drawer** — There shall be two drawer units arranged side by side in large size shelving cabinet. These shall be made out of mild steel sheet not less than 0·8 mm thick. The drawers shall work on single extension principle and shall be fitted with a suitable lock having not less than four levers with duplicate keys made out of non-corrodible metal. The minimum overall dimensions of the drawers shall be as follows:

- a) Width 300 mm,
- b) Depth 400 mm, and
- c) Height 140 mm.

## 5. ASSEMBLY

**5.1** The various components shall be assembled by means of bolting or welding.

**5.2** The method of gas welding, arc welding and spot welding shall conform to IS : 1323 - 1966\*, IS : 816 - 1969† and IS : 819 - 1957‡ respectively.

## 6. ADDITIONAL ACCESSORIES

**6.1** The following additional accessories may be provided if so desired by the purchaser:

- a) *Hanging Rod* — This shall be of mild steel conforming to IS : 7138 - 1973§ or aluminium tubular pipe with a wall thickness of not less than 1·6 mm and 20 mm in diameter. The mild steel hanging rod shall be covered with an aluminium sheet not less than 0·56 mm thick and in the case of aluminium hanging rod it shall be anodized or buffed. The hanging rod shall be fitted to the cabinet lengthwise with suitable brackets.
- b) *Mirror Frame* — This shall be of mild steel sheet not less than 0·8 mm thick bent in a frame of 25 mm border and screwed generally to the left door on the outside.
- c) *Mirror* — The mirror shall be not less than 5 mm thick. It shall be sizes 1 250 × 300 mm or 400 × 300 mm as specified in IS : 6184-1971|| and shall be of plate glass.

\*Code of practice for oxy-acetylene welding for structural work in mild steel (*first revision*).

†Code of practice for use of metal arc welding for general construction in mild steel (*first revision*).

‡Code of practice for resistance spot welding for light assemblies in mild steel.

§Specification for steel tubes for furniture purposes.

||Specification for dimensions for furniture mirrors.

d) *Tie Hanger* — This shall be made out of aluminium or mild steel sheet not less than 0.63 mm thick. The mild steel tie hanger shall be finished in accordance with 8.

## 7. LOADING

7.1 The maximum static loads uniformly distributed and applied on the shelves may not exceed those given in Table 3. The loads may be taken as a guide in ordering shelves.

**TABLE 3 SAFE DISTRIBUTED LOADS FOR SHELVES FOR SHELVING CABINETS**

WIDTH (1)	DEPTH mm	LOAD kg
760	430	185
910	480	150

## 8. FINISH

### 8.1 Sheet Metal Components

8.1.1 All dents, burrs and sharp edges shall be removed from the various components. The components shall be individually pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign element.

8.1.2 Immediately after pickling, all the mild steel parts shall be given phosphating treatment conforming to Class C of IS : 3618 - 1966\*. The process for application of phosphate coating shall be in accordance with IS : 6005 - 1970†.

NOTE — Putty shall be applied to all the surfaces requiring filling and shall conform to IS : 110-1968‡. Aluminium primer shall conform to IS : 5660 - 1970§.

8.1.3 Coat/coats of enamel paint shall then be applied as follows:

- a) Finish coat with enamels conforming to IS : 151 - 1950||, IS : 2932 - 1974¶ or IS : 2933 - 1975\*\*; and
- b) In case of stoving enamel the components shall thereafter be baked at a specified temperature in an oven heated uniformly. The finish shall be smooth and uniform with hard tough film of enamel strongly adhering to the surface. The finish shall be free from all visible defects and shall not chip when tapped lightly with a dull pointed instrument.

\*Specification for phosphate treatment of iron and steel for protection against corrosion.

†Code of practice phosphating of iron and steel.

‡Specification for ready mixed paint, brushing, grey filler, for enamels, for use over primers (*first revision*).

||Specification for ready mixed paint, brushing, aluminium red oxide primer.

¶Specification for ready mixed paint, spraying, finishing, stoving, enamel, for general purposes, colour as required.

\*\*Specification for enamel, synthetic, exterior (a) under coating, (b) finishing (*first revision*).

\*\*Specification for enamel, exterior (a) under coating, (b) finishing (*first revision*).

**8.2** All components shall be finished in colour as agreed to between the purchaser and the manufacturer.

## **9. PERFORMANCE REQUIREMENTS OF FINISH**

**9.1 Scratch Hardness Test** — A sample of mild steel plate  $150 \times 50$  mm in size and thickness 0.315 mm and finished as described in 8 shall be subjected to scratch hardness test in accordance with 15.1 of IS : 101-1964\*. A scratch, showing the bare metal shall not be produced on the test sample.

**9.2 Pressure Test** — Samples prepared from mild steel plates of thickness 0.315 mm and finished as described in 8 shall be subjected to pressure test in accordance with 15.2 of IS : 101 - 1964\*. The metal surface shall not be rendered visible when the test pieces are separated after the test.

**9.3 Flexibility and Adhesion Test** — A sample of mild steel plate  $150 \times 50$  mm in size and thickness 0.315 mm and finished as described in 8 shall be subjected to flexibility and adhesion test in accordance with 16 of IS : 101-1964\*. The paint film on the test piece shall not show damage, detachment or cracking when examined under  $\times 10$  magnification.

**9.4 Stripping Test** — A sample of mild steel plate  $150 \times 50$  mm in size and thickness 0.315 mm and finished as described in 8 shall be subjected to stripping test in accordance with 17 of IS : 101-1964\*. The scratch produced after the test shall be free from jagged edges.

**9.5 Test for Protection Against Corrosion under Conditions of Condensation** — A mild steel panel of size  $150 \times 100$  mm and thickness 1.25 mm and finished as described in 8 shall be subjected to test for protection against corrosion under conditions of condensation in accordance with 18 of IS : 101-1964\*. The metal surface shall show no signs of corrosion after the test.

## **10. INFORMATION TO BE SUPPLIED BY THE PURCHASER**

**10.1** The purchaser shall supply the following information to the supplier alongwith the order:

- a) Whether locker/drawer is required or not;
- b) Number of adjustable shelves required;
- c) Colour of finish; and
- d) Where alternative methods of construction and finish are specified, they shall be clearly stated in the order.

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\*Methods of test for ready mixed paints and enamels (*second revision*).

## 11. PACKING

11.1 All the component parts shall be packed in such a way that no damage is caused to them during transit.

## 12. MARKING

12.1 All steel shelving cabinets shall be marked with a suitable mark identifying the manufacturer.

12.1.1 The steel shelving cabinets may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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